

Soxtec™ 2000 series Solvent Extraction Solution



Soxtec™ solvent extraction systems for safe, convenient and economical determination of soluble, or extractable, matter. Typically five times faster than classical Soxhlet equipment, Soxtec™ systems provide rapid analysis with absolutely no loss in precision or accuracy. Soxtec™ 2000 series comprises 4 different solvent extraction systems and a unique, patented hydrolysis unit (SoxCap 2047) for hydrolysis including filtration and washing.

Sample	Parameters
Food, Feed, Agriculture, Soil, Wastewater, Sludge, Textiles, Plastics, Petrochemicals, Pharmaceuticals, Paper and a wide range of other industrial products.	Crude Fat, Total Fat Extractable matter

Just load, start and walk away

For 30 years, FOSS has developed and supplied instruments with a mission: to always make routine analysis simpler.

A great step forward

As early as 1975, we revolutionised solvent extraction by introducing Edward Randall's patented two-stage technique for boiling and rinsing as RaFaTec – Randall Fat Tecator.

Six years later, FOSS launched an improved system, Soxtec™, based on Tecator™ technology, that also handled solvent recovery.

Soxtec 2050 is the next great step forward in solvent extraction. A solvent extractor that needs practically no handling by lab personnel.

A fully automatic Soxhlet analyzer that is the fastest on the market, using less solvent and less water.

A profitable solution

Soxtec™ extractors range in capacity and function from the small Soxtec 2045 to the fully automatic Soxtec 2050. All Soxtec models fully utilise our batch handling concept to make sample processing as easy and safe as possible. Whatever your Soxhlet extraction need is, we can offer you the right solution.

Safety is important

Minimal manual handling assures safety in the process. When the sample has been loaded, the solvent is added in a closed, secure system. The solvent dispenser, automatic solvent recovery and built-in fume hood limit solvent vapour to a minimum, thus ensuring a safe working environment.

Safety has always been important to us, the only electrical part in the Extraction unit, the hot plate, is spark proof. The dual temperature sensors ensure that the set temperature is kept and that the ignition point is never reached for any solvent.

Soxtec™ 2050 guarantees a safe working environment – the entire analysis takes place in a closed, secure system. It is de-



signed and built to surpass strict International safety standards. There is simply no safer solvent extraction system available.



Operating convenience

Soxtec 2050's automation improves efficiency. Overall laboratory efficiency is further improved by the purpose-developed handling tools delivered with the Soxtec system. The tools for simple batch-wise sample handling save time, simplify usage and minimise risk of operator error. There is no longer any need for manual handling of thimbles or hot extraction cups.

	Soxhlet	Soxtec™
Extraction time	8 ~ 16 hrs	About 1.5 hrs
Safety	Poor	Built-in
Extraction condition	Repeated elution with cold solvent	Boiling and rinsing extraction
Solvent collection function	Unavailable	Available

The differences between Soxhlet and Soxtec™ methods

Technology



Soxtec™ Systems

Solvent extraction systems for safe determination of soluble matter in food, feed, soil, polymers, textiles, paper pulp, and more. Whatever your Soxhlet extraction needs, we can offer the right solution.

	Soxtec™ 2045	Soxtec™ 2043	Soxtec™ 2055	Soxtec™ 2050	SoxCap™ 2047
Sample positions	2	6	6	6	6
Capacity, samples per day	12	36	36	42	36
Solvent volume per sample	50 – 70 ml	40 – 50 ml	70 – 90 ml	70 – 90 ml	–
Solvent recovery	80%	80%	80%	80%, automatic	–
Closed solvent addition	No	No	Yes	Yes	–
Programmable	Yes	Yes	Yes	Yes	No
Fully automated	No	No	No	Yes	No
Overnight operation	No	No	No	Yes	No
Batch handling	Yes	Yes	Yes	Yes	Yes
Extraction cups	Glass & Aluminium	Glass & Aluminium	Glass & Aluminium	Glass & Aluminium	–
Thimbles	Cellulose, Glass	Cellulose, Glass	Cellulose, Glass	Cellulose, Glass	Cellulose
Thimble diameter	26, 33	26	26, 33	26, 33	30
Thimble volume	30 ml or 65 ml depending on thimble size	30 ml	30 ml, 65 ml depending on thimble size	30 ml, 65 ml depending on thimble size	50 ml
Heating	Remotely controlled electric	Remotely controlled electric	Remotely controlled electric	Remotely controlled electric	Electric
Temperature range	0 – 285°C	0 – 285°C	0 – 285°C	0 – 285°C	–
Overtemperature protection	145, 210 & 330°C	145, 210 & 330°C	145, 210 & 330°C	145, 210 & 330°C	–
Power consumption	1500 W	1500 W	1550 W	1590 W	500 W
Water consumption	2 l/min	2 l/min	2 l/min	2 l/min	0.4 l/min
Water saving system	No	No	No	Yes	No
Dimensions, cm	34×27×58	51×32×58	60×38×58	60×38×58	19×30×11
Accuracy	± 1% relative	± 1% relative	± 1% relative	± 1% relative	± 1% relative



Fully automated, unattended operation

The Soxtec 2050 utilises a new, patented four-step solvent extraction technique. It performs boiling, rinsing and solvent recovery. In its fourth step, the sample cup lifts off the hot plate, using residual heat to pre-dry while eliminating boil-dry risk. The entire process is a fully automatic, unattended operation. You just load, start and walk away. Soxtec 2050 will even shut down automatically when finished.

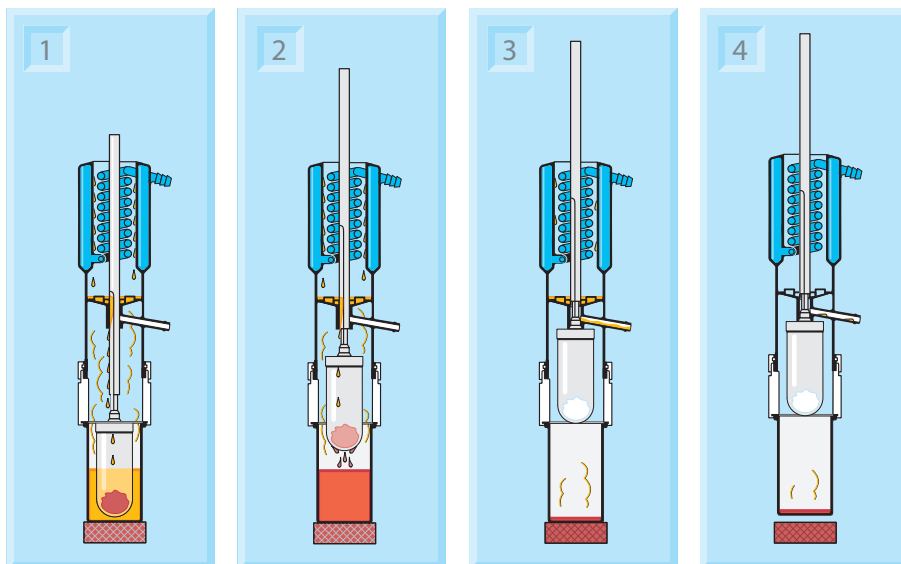
Because it frees operators from routine tasks, Soxtec 2050 helps to improve your laboratory's productivity.

And it's very quiet – an additional bonus for the laboratory working environment.

Application flexibility

Soxtec systems are developed for maximum application flexibility. Users can easily design and optimise their own applications for accurate, safe determination of soluble matter within the food, feed, environmental and industrial sectors.

Soxtec can handle larger sample volumes (a standard 33×80 mm thimble), and its higher temperature range even enables effective use of high-boiling point solvents, such as Toluene and Xylene. Furthermore, the Glass/Teflon solvent interface makes it possible to run metal-sensitive applications.



Four automatic steps

- 1 **Boiling**
Rapid solubilisation in boiling solvent.
- 2 **Rinsing**
Efficient removal of remaining soluble matter.
- 3 **Recovery**
Automatic collection of distilled solvent for re-use.
- 4 **Pre-drying**
Elimination of boil-dry risk.

The fastest on the market

Typically five times faster than the classical Soxhlet technique, in Food and Feed Applications, Soxtec Systems are the fastest Soxhlet extractors on the market.

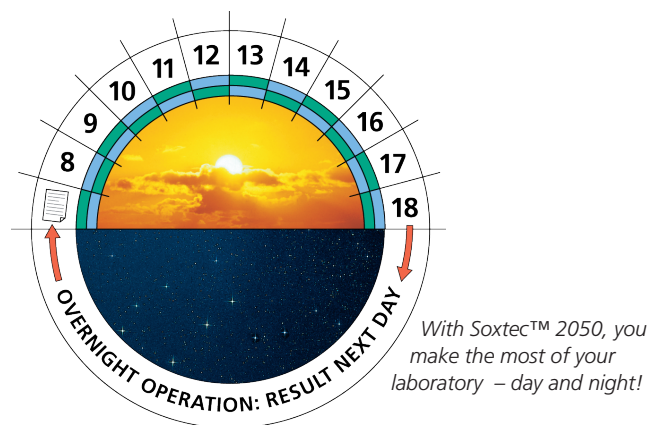
With Soxtec 2050 you can extract as many as seven batches per day, with absolutely no loss in precision or accuracy. The Soxtec systems follow officially approved methods for example fat in feed (AOAC, ISO), cereals (ISO) meat (AOAC), PCB (EPA) and paper pulp (SCAN).

Total fat analysis

In food, cereals and feed, fat often occurs in the form of phospholipids, and glycolipids or lipoproteins. These bound forms of fat are not recovered by standard solvent extraction procedures, and must first be released by means of acid hydrolysis. The SoxCap™ 2047 is an integral part of the Soxtec systems. It offers total fat analysis in accordance with recognised methods. The SoxCap system performs hydrolysis, filtration and washing without any sample transfer. This patented technique offers high throughput together with minimum manual handling using batch handling tools. It is the only Hydrolysis system which has been validated in parallel with a collaborative study.

Accuracy

The accuracy of the SoxCap method has been verified by comparison with the revised prEN ISO/DIS 7302 method, as the same samples were used and the analyses were performed at the same time. prEN ISO/DIS 7302 became ISO11085 on publication.



Save time and money

Soxtec 2050 shortens the analysis time, increasing throughput to up to seven extractions per day. Furthermore, the automatic shutdown function enables overnight operation*. Its automatic operation frees operators from time-consuming routine tasks, thereby increasing laboratory efficiency.

Most users prefer aluminium extraction cups – only environmental applications require glass cups. Aluminium cups are unbreakable, and they offer rapid heat transfer, which in turn shortens heating and drying times.

Soxtec systems use environmentally sound technology. Compared to classical Soxhlet, these systems use a significantly lower solvent volume. No other Soxhlet extractor on the market uses solvents so efficiently. Thanks to solvent recovery, 16 ml of solvent is typically used per sample keeping costs for solvent purchase and disposal to a minimum. Built-in water control minimises water consumption.

**Subject to local regulation*

Dramatically reduced extraction times	Soxhlet	Soxtec™
Analyte	Extraction time	Extraction time
Fat in feed	2 h to 16 h	1 h
Fat in food (eg. meat, cereals)	2 h to 16 h	1 h
PCB, PAH & Pesticides in soil	17 h	2 h
Oil & Grease in water	4 h	45 min
Extractable Matter in polymers & rubber	2 h to 48 h	1 h to 5 h
Extractable Matter in paper & pulp	2 h to 48 h	1 h to 5 h
Extractable Matter in explosives & propellants	16 h	1 h
Hydrocarbons in petroleum rock	24 h	2 h
Finishing Oil on textile & synthetic fibres	2 h	30 min
Anti-caking coating on fertilisers	3 h to 4 h	1 h
Detergent in detergent powder	5 h	1 h
Fat in leather	5 h	1 h

FOSS



Secure your investment with a FossCare™ Support Agreement

Let FOSS take care of you for a maximum return on your analytical investment. Get a four year warranty as part of the new FossCare Premium Preventive Maintenance Agreement or two years as part of any other FossCare agreement. In addition to the peace of mind afforded by the warranty period, the continual preventive maintenance pays off by keeping your analytical instruments working perfectly every day, year after year.

Why preventive maintenance?

As with any analytical solution, it is essential that your FOSS instrument receives regular maintenance to ensure optimal performance and extended lifetime. Avoiding expensive downtime is a matter of following factory standards and preventively replacing parts before they wear out. In turn, this helps ensure reliable and consistent results at the highest level.

Preventive and predictive maintenance combined with global support from 300 dedicated service, application, software and calibration specialists keeps your instrument running perfectly all year round.



Benefits of a FossCare™ Support Agreement:

- Extended Warranty (two or four years depending on the chosen agreement)
- Regular maintenance; the instrument is diagnosed, cleaned, adjusted, tested, fine tuned and recalibrated
- Minimal downtime from replacing components before they are worn out
- Consistent, accurate and reliable results you can always trust
- Preventative maintenance visits when it suits you (your business)
- 24/7 phone support - no need to worry about closing hours or PO
- Low, fixed service budget prevents unexpected expenses
- Discounts on additional services, spares, training, reagents, consumables and software upgrades

Contact your local Foss office for more information.

Dedicated Analytical Solutions

Ordering information

Soxtec™ 2043:

- 20430001 Soxtec 2043, 230 V complete with:
1 ea Soxtec 2043 Extraction Unit
1 ea Soxtec 2046 Control Unit
1 ea Food/Agri routine accessories kit comprising:
Extraction cups (1 set of 6), Cup holder, Thimbles (set of 25), Thimble adaptors (1 set of 6), Thimble stand, Seals in Viton and Butyl, Manual and Application Note.
- 20430002 Soxtec 2043, 115 V. As above.

Consumables & Accessories for Soxtec™ 2043:

- 15220018 Cellulose thimbles, 26mm (set of 25)
10001467 Thimble handler
10001464 Thimble support
10001080 Thimble support holder
10001431 Cup holder
10001473 Thimble stand, Metal
10001462 Extraction cups (set of 6), Aluminium
10001820 Extraction cups (set of 6), Glass
10002516 Seals for condensers, Viton (set of 6)
10002517 Seals for condensers, Butyl (set of 6)
10005712 Seals for condensers, Teflon (set of 6)
10010524 Seals for condensers, Polyurethane (set of 6)

Soxtec™ 2045:

- 20450001 Soxtec 2045, 230 V complete with:
1 ea 2045 Extraction Unit
1 ea 2046 Control Unit
1 ea Food/Agri routine accessories kit comprising:
Extraction cups (1 set of 2), Cup holder, Thimbles (set of 25), Thimble adapters (1 set of 6), Thimble stand, Seals in Viton and Butyl, Manual and Application Note.
- 20450002 Soxtec 2045, 115 V. As above.

Consumables & Accessories for Soxtec™ 2045

- 15220045 Cellulose thimbles, 33mm (set of 25) single thickness
15220030 Cellulose thimbles, 33mm (set of 25) double thickness
15220018 Cellulose thimbles, 26mm (set of 25) double thickness
10007524 Thimble adapter, 33mm (set of 6)
10001466 Thimble adapter, 26mm (set of 6)
10011723 Cup holder
10007446 Thimble stand, Metal
10002290 Extraction cups (set of 2), Aluminium

- 10002291 Extraction cups (set of 2), Glass
10002705 Seals for condensers, Viton (set of 2)
10002706 Seals for condensers, Butyl (set of 2)

Soxtec™ 2050:

- 20500001 Soxtec 2050, 230V complete with
1 ea Soxtec 2050 Extraction Unit
1 ea Soxtec 2050 Control Unit
1 ea Soxtec 2050 Drive Unit
1 ea Food/Agri Routine Accessories kit comprising:
Extraction cups (3 sets of 6), Cup holder, Thimble support, Thimble holder, Thimbles (set of 25), Thimble adaptors (2 sets of 6), Thimble handler, Tongs for extraction cups, Thimble stand (2), Cup stand, Seals of Viton and Butyl, Solvent addition tube, Solvent emptying tube, Manual and Application Note.
- 20500002 Soxtec 2050, 115V. As above.

Soxtec™ 2055:

- 20550001 Soxtec 2055, 230V Complete with
1 ea Soxtec 2055 Extraction Unit
1 ea Soxtec 2055 Control Unit
1 ea Food/Agri routine accessories kit comprising:
Extraction cups (3 sets of 6), Cup holder, Thimble support, Thimble holder, Thimbles (set of 25), Thimble adaptors (2 sets of 6), Thimble handler, Tongs for extraction cups, Thimble stand (2), Cup stand, Seals in Viton and Butyl, Solvent addition tube, Solvent emptying tube, Manual and Application Note.
- 20550002 Soxtec 2055, 115V. As above.

Consumables and Accessories for Soxtec™ 2050 and Soxtec™ 2055

- 15220030 Cellulose thimble, 33mm (set of 25) double thickness
15220045 Cellulose thimble, 33mm (set of 25) single thickness
10007510 Extraction Cups (set of 6), Aluminium
10007673 Extraction Cups (set of 6), Glass
10007525 Seals for condensers, Viton (set of 6)
10007526 Seals for condensers, Butyl (set of 6)
10007830 Seals for condensers, RESEL (set of 6)
10013969 Seals for condensers, Polyurethane (set of 6)
15210072 Solvent dispenser

For total fat determination, used in conjunction with Soxtec™ Extraction Systems we recommend:

SoxCap™ 2047

Compatible with Soxtec models 2050, 2055, 2045 (1045 HT2)

- 20470001 SoxCap™ 2047, 230 V, 50-60 Hz complete with: Ceramic Hot Plate 2022, Condenser holder with valve plate, Condenser, Hydrolysis Beaker, Beaker, Boiling Stand, Capsule Tray (set of 2), Drying Stand, Glass Capsules (2 sets of 6), Filters (set of 100), Thimbles (set of 25), Adapters (set of 6), Cotton, Water Aspirator, User Manual
- 20470002 SoxCap™ 2047, 115 V, 50-60 Hz. As above.

SoxCap™ 2047mini

Compatible with Soxtec models 2043 (1043 HT6)

- 20470003 SoxCap™ 2047mini, 230 V, 50-60 Hz complete with: Ceramic Hot Plate 2022, Condenser holder with valve plate, Condenser, Hydrolysis Beaker, Beaker, Boiling Stand, Capsule Tray (set of 2), Drying Stand, Glass Capsules mini (2 sets of 6), Filters (set of 100), Thimbles (set of 25), Adapters (set of 6), Cotton, Water Aspirator, User Manual
- 20470004 SoxCap™ 2047mini, 115 V, 50-60 Hz. As above.

Consumables & Accessories for

SoxCap 2047 & SoxCap 2047mini

- 10012381 Filters, set of 100
- 15220053 Cellulose Thimbles 28 × 22 mm, set of 25
- 10012233 Hydrolysis Beaker
- 10011595 Beaker, Low
- 10013849 Condenser
- 10013840 Condenser with drip tray assembly
- 10012227 Boiling Stand
- 10012229 Drying Stand
- 10012230 Capsule Tray
- 10012379 Adapters, set of 6
- 10012378 Glass Capsules, set of 6 for SoxCap 2047
- 60022802 Glass Capsules mini, set of 6 for SoxCap 2047mini only
- 15290009 Cotton, defatted

Installation requirements

Soxtec™ 2043						
Equipment	Power supply	Power consumption	Dimensions w × d × h cm	Weight	Water supply	Ventilation
Extraction Unit	-	-	57 × 35 × 58	30 kg	2 l/min	Fume hood min. airflow 0,5 m/s (inter locked)
Control Unit	230 V, 50-60 Hz 115 V, 50-60 Hz	1250 W	28 × 23 × 19	3 kg	-	-

Soxtec™ 2045						
Equipment	Power supply	Power consumption	Dimensions w × d × h cm	Weight	Water supply	Ventilation
Extraction Unit	-	-	34 × 27 × 58	18 kg	1-2 l/min	Fume hood min. airflow 0,5 m/s (inter locked)
Control Unit	230 V, 50-60 Hz 115 V, 50-60 Hz	600 W	28 × 23 × 19	3 kg	-	-

Soxtec™ 2050						
Equipment	Power supply	Power consumption	Dimensions w × d × h cm	Weight	Water supply	Ventilation
Extraction Unit	-	-	60 × 38 × 58	30 kg	2 l/min	Fume hood min. airflow 0,5 m/s (inter locked)
Control Unit	230 V, 50-60 Hz 115 V, 50-60 Hz	1 550 W	31 × 24 × 16	3 kg	-	-
Drive Unit	230 V, 50-60 Hz 115 V, 50-60 Hz	40 W	40 × 28 × 12	8 kg	-	-

Soxtec™ 2055						
Equipment	Power supply	Power consumption	Dimensions w × d × h cm	Weight	Water supply	Ventilation
Extraction Unit	-	-	60 × 38 × 58	30 kg	2 l/min	Fume hood min. airflow 0,5 m/s (inter locked)
Control Unit	230 V, 50-60 Hz 115 V, 50-60 Hz	1 550 W	31 × 24 × 16	3 kg	-	-

SoxCap™ 2047 & SoxCap™ 2047 ^{mini}					
Equipment	Power supply	Power consumption	Dimensions w × d × h cm	Weight	Water supply
2022 Hot Plate	230 V, 50-60 Hz 115 V, 50-60 Hz	500 W	19 × 30 × 11	2,5 kg	2 taps needed: 0,4 l/min Tap water for vacuum pump

Performance data

	Soxtec™ 2043	Soxtec™ 2045	Soxtec™ 2050	Soxtec™ 2055
Thimble size	26 × 60 mm Approx. 25ml	33 × 80 mm, 65ml, 0.5 to 15 g depending on sample		
Solvent volume	40 ml.	60 ml.	70-90 ml.	70-90 ml.
Extraction time	Typically 40 to 60 min, depending on application			
Capacity/batch	6 samples	2 samples	6 samples	6 samples
Capacity/day	30-36 samples	10-12 samples	42 samples	30-36 samples
Measuring range	0.1-100% fat			
Accuracy	According to official approvals			
Repeatability	± 1% rel. or better at 5-100% fat			
Heating up time	from 20°C to 285°C in 7-9 min (230 V)	from 20°C to 285°C in 10 min (230 V)	from 20°C to 285°C in 7-9 min (230 V)	from 20°C to 285°C in 7-9 min (230 V)

	SoxCap™ 2047 SoxCap™ 2047mini
Sample size	0.5 - 3 g
Hydrolysis time	60 min.
Measuring range	0.1 - 100 % fat
Capacity/batch	6 samples
Capacity/day	Up to 30 analyses

FOSS

FOSS
Foss Allé 1
DK-3400 Hilleroed
Denmark

Tel.: +45 7010 3370
Fax: +45 7010 3371

info@foss.dk
www.foss.dk

